Texto para discussão

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Street protests against Dilma Rousseff's administration and corruption in Brazil: the "higher education effect"

Marcelo Justus
Gustavo O. Aggio

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Instituto de Economia
UNICAMP

Street protests against Dilma Rousseff's administration and corruption in Brazil: the "higher education effect"

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Marcelo Justus[1], Gustavo O. Aggio[1]

Abstract

We calculated a rate for street protests against the Dilma Rousseff's administration and federal corruption that took place in Brazil from March 15, 2015 to March 18, 2016. We found a strong correlation between the total number of demonstrators estimated by the military police and by the demonstrations' organizers. Assuming that the corruption allegations and economic crisis have affected the entire Brazilian society, we sought to answer the following question: what role did higher education play in determining the scale of those street protests? Apart from other useful statistical relationships for an evidence-based discussion, such as the role of income inequality, we identified a strong positive correlation relationship between the percentage of higher education graduates in the population aged 25 or older and the demonstration rate.

Keywords: street protests, demonstrations, Dilma Rousseff's administration, corruption

1. Introduction

From a political point of view, the beginning of the Dilma Rousseff's administration inherited part of former President Lula's popularity and maintained the main party alliances that laid the foundation for the Workers Party's governability in the so-called Brazil's coalitional presidentialism. However, the favorable governance scenario of Rousseff's government changed with a setback in her apparent popular support triggered by two factors. The first was a wave of demonstrations that took place in June 2013 and received great media coverage, which led the federal government to announce a series of measures to improve public services, such as the launch of the Mais Médicos (More Doctors) Program. The second, in early 2014, consisted in the first news reports about the *Lava Jato* (Car Wash) operation run by the Federal Police, which identified several corruption schemes involving federal administration officials, major political party members and state-owned enterprises – mainly Petrobras, which led a huge process of investments over the past years.

Plea bargain agreements signed with the first suspects arrested in the Lava Jato operation allowed the task force to broaden the scope of investigations to include famous politicians and businessmen. The accusations and public disclosure of facts did not prevent President Dilma Rousseff – who has not been personally implicated in any

*Corresponding author.

Email addresses: mjustus@unicamp.br (Marcelo Justus), aggio@unicamp.br (Gustavo O. Aggio)

[1]Center for Social, Urban and Regional Economics (Nesur) – Institute of Economics, University of Campinas, São Paulo, Brazil.

of the cases so far – from winning reelection, but led to great public dissatisfaction, especially from 2015 on.

On the economic side, macroeconomic variables have been gradually deteriorating over the years. On the one hand, inflation reached 6% or more in mid-2012, exceeding the inflation target ceiling of 6.5% and surpassing the 10 percent mark in the twelve-month period which ended on December 31, 2015. On the other hand, economic activity took a sharp downturn in early 2014, leading to a significant increase in the unemployment rate in 2015. In short, it became clear that there was an imbalance in the relationship between output, employment, and inflation.

In keeping with her campaign promise, in 2015, President Dilma Rousseff replaced a Keynesian Finance Minister with a new one with a different profile to rebalance public accounts and adjust government-regulated prices. These prices were lagging behind other prices in the economy, as they were used to prevent inflation from rising, thus distorting relative prices. While a significant number of the specialized public demanded adjustment measures, their contractionary effects led to a decline in support for the president, including among her own constituency.

In this context, several demonstrations broke out against Rousseff's government and against corruption. As the numbers of protesters estimated by the Military Police and by the demonstrations' organizers were widely disseminated by the media, an important question came up: which of the two estimates is the "best one?" While this question is unquestionably relevant, it is not essential for understanding the phenomenon. In this paper, we found a strong correlation between the two estimates. The key question for us is: what is the explanation (besides the population size) behind the difference in the number of protesters in different cities? We sought to answer this question with the main objective of identifying the role of higher education in the magnitude of the demonstrations that took place across the country.

The social movements against Rousseff's government reflect the great polarization between her voters and those of candidate Aécio Neves seen in the demonstrations and public and virtual events that took place mainly (but not only) in the 2014 presidential run-off. Thus, it should be noted that the number of protesters who took to the streets in a wave of demonstrations – according to the definition by Alonso and Mische (2016) – in June 2013 was unusual for this type of event. The demonstrations, which started as a wave of protests against public transportation fare hikes, soon included a wide range of demands and sparked national outrage, making it impossible to identify one or more organized social movements. In such a scenario, the issues of corruption, high costs of the World Cup and Olympics, and low quality of public services became the main sources of complaints against the federal government. Thus, the profile of the protesters who took to the streets in the June 2013 street protests was similar to that of the groups that would be set up to initiate a grassroots campaign against Dilma Rousseff's government in 2014-2015.[2]

According to the Datafolha polling institute, the demonstration that took place on March 13, 2016 – the biggest street protest in Brazil's history – gathered 500,000 protesters on the popular Avenida Paulista in São Paulo, among whom 77% were college graduates and the rest had either high-school education (18%) or primary education

[2]Of course, in the 2014 presidential elections there was a group of political parties aligned with the main opposition candidate that encouraged those who disapproved of the Dilma Rousseff's administration to protest against it. Just as after the elections there was a strong presence of members of the Free Brazil Movement and the iconoclastic "Fiesp Duck" alongside a more voluntary participation of the public in the demonstrations against President Dilma Rousseff.

(4%).[3] These estimates support the hypothesis that a high number of college graduates attended the protests against Rousseff's administration and corruption. Singer (2013) had already suggested that many college graduates participated in the demonstrations that broke out in June 2013. Our conjecture is that most people in this group took an anti-Rousseff position after the 2014-2015 polarization. Thus, our hypothesis is that there is a positive relationship between higher education and the scale of the demonstrations.

The remainder of this paper is organized as follows: Section 2 presents the methodology and empirical results, while Section 3 provides our concluding remarks.

2. Empirical Modeling

2.1. Street protest rate

We used the estimates provided by the Military Police and by the organizers of the protests to measure the total number of people who participated in the demonstrations that took place in 278 Brazilian municipalities.[4]

We calculated the average total number of people in each municipality where there was at least one demonstration between March 15, 2015 and March 18, 2016 (there were between 1 and 6 events in 12 months). Hence, we reduced any possible bias in these estimates.

The next step was to calculate the average percentage differences between the estimates made by the two sources in each of the municipalities by applying

$$\frac{1}{m}\sum_{j=1}^{m}\left(\frac{O_j - P_j}{P_j}\right) \times 100$$

where m is the number of events. O_j and P_j are the estimated total numbers of demonstrators in street protest j according to the organizers (henceforth, Org) and the Military Police (henceforth, MP), respectively.

One interesting evidence is that the shape of the distribution curve for the average percentage differences is similar to the log-normal distribution. Thus, as shown in Figure 1, the estimated density function of the distribution of the log of this variable approximates to a normal distribution.

Next, we produced a rate for measuring the participation per thousand inhabitants in the protests against Rousseff's government considering the population size in the 278 municipalities. This demonstration rate per thousand inhabitants was calculated using the data from both sources, that is: the Military Police (DR-MP) and the organizers (DR-Org). The population data was taken from the 2010 Demographic Census.

2.2. Demonstration rate and the result of the National Congress impeachment vote

Table 1 shows DR-MP and DR-Org in decreasing order by Brazilian region. In the South region, the rate is 26.4 people per thousand inhabitants according to the police estimate, and approximately 39 based on the organizers' estimates. Hence, DR-Org is around 1.5 times DR-MP in this region. In the Midwest, Southeast and Northeast regions, the ratio between the two measures is almost equal, somewhere around 1.7. This ratio is only slightly higher in the North region.

[3]The survey is available at: http://media.folha.uol.com.br/datafolha/2016/03/14/manifestacao_13_03_2016.pdf.

[4]Data taken from http://especiais.g1.globo.com/politica/mapa-manifestacoes-no-brasil/16-12-2015/

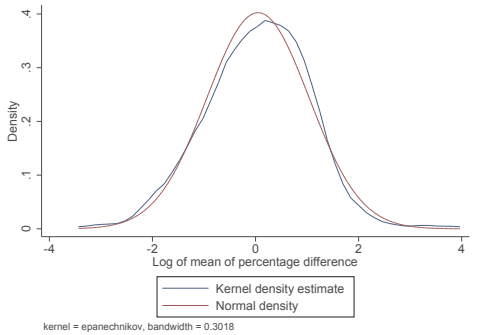

Figure 1: Estimate of the density function of the distribution of the log of the average percentage differences between the total number of demonstrators according to the organizers and the Military Police

Table 1: Demonstration rate according to the organizers and the Military Police, ratio of the two measures, and percentage of representatives who voted in favor of continuing the impeachment process against Dilma in the National Congress – by Brazilian region

Region	DR-MP (a)	DR-Org (b)	(b)/(a)	% Vote
South	26.40	39.06	1.48	80.52
Midwest	13.21	21.91	1.66	82.92
Southeast	10.55	18.30	1.73	78.21
North	8,62	15.77	1.83	70.76
Northeast	6.82	11.32	1.66	56.29
Brazil	13.79	22.36	1.62	72.82

On April 17, 2016, the Brazilian House of Representatives voted by 367 votes to 137 to continue the impeachment process against Dilma Rousseff in the National Congress. We compared the percentages of votes in favor of referring the process to the Federal Senate with the rates in Table 1. Curiously, it can be seen that the voting followed almost the same classification as that of the DR-MP or DR-Org. There is a moderate correlation between the percentage of votes and DR-MP, for example – around 0.6.

2.3. Empirical Results and Discussion

We used the 278 observations relating to the measures calculated based on the estimates from the two sources to estimate the correlation between them. Surprisingly, we found a high correlation between DR-MP and DR-Org – around 0.83. Figure 2 clearly shows this strong correlation between the two sources' estimates. Based on this evidence, the choice of measure is not relevant for analyzing any variation between the municipalities. We chose the logarithm of DR-MP as the dependent variable for the classical linear regression model that we will specify, estimate and analyze below.

Table 2 shows the OLS estimates of the coefficients, standard errors, and the hypothesis tests on the residuals of the four specifications. Column I shows the results of our benchmark model. Column II show the model's results that contains additional regressors in order to check the robustness, especially for the variable of interest in this paper: higher education. The only difference in the specifications III-IV is the substitution of income inequality with other similar measures also to check the stability of the results.

The specification of our empirical model contains some social, economic, and political variables that are repeatedly found to be factors that influence the scale of popular

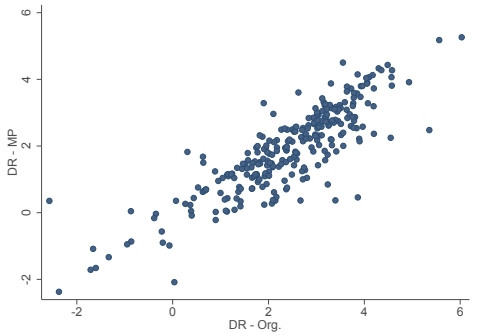

Figure 2: Correlation between the two sources' estimates (in log)

demonstrations that have taken place. Notwithstanding the simplicity of the model and the estimation method, our results are statistically robust. First, because there are no potentially endogenous regressors, and second because, as can be seen at the bottom of the table, the residuals are homoscedastic and are normally distributed. Figure 2 shows the estimate of the density function of the distribution of the benchmark model residuals.

The prevalence of higher education is measured by the log of the percentage of people aged 25 or above with a college degree (`higher education`). Our expectation, which was mainly founded on reports from DataFolha surveys, was that the relationship between this variable and demonstration rate would be positive. We found strong statistical evidence that backs up the hypothesis laid down in Section 1: the relationship between higher education and the scale of the demonstrations against Dilma Rousseff and corruption is positive. It is noteworthy that this conclusion remained even when adittional regressors and others income inequality meansures were used (see specifications II-IV).

The results show that the prevalence of higher education played a major role in the scale of the demonstrations that broke out in the period covered by this sample. At least a part of the difference in DR-MP between the municipalities was the result of the different rates of higher education between municipalities. In other words, the higher the percentage of the population aged 25 or over with a college degree, the greater the number of people per thousand inhabitants that took to the streets to express their position against Rousseff's government and against corruption. We estimate an elasticity of 1.6% in demonstration rate per thousand inhabitants in response to a 1% variation in higher education. In other words, the more people with a college degree, the more people per 1,000 population took to the streets to protest against the Dilma Rousseff's administration and corruption.

Apart from higher education, we controlled for any possible effects on the five large Brazilian regions using four binary variables. We also controlled for the size of the pro-government constituency by using the percentage of valid votes cast for Dilma in the 2014 presidential election run-off (`votes`).[5] The high positive elasticity found – around 0.8 – supports the assumption that a large part of Dilma Rousseff's constituency remained loyal to her.

Still on the subject of her political strength, we used a binary variable to control for any possible influence of the governors of the states where the protests took place.

[5]Data taken from the website `www.tse.jus.br`.

This variable (`ally`) was given the value 1 if the governor elected in 2014 was, at the time, a member of the Workers' Party (PT) or of a coalition party and 0 otherwise.[6]

To control for the support of the very low-income population – another conjecture that has been repeatedly defended – we used the total amount transferred by the Bolsa Família (Family Grant) Program (PBF) per thousand inhabitants (`conditional cash transfer`. PBF is the most wide-ranging and successful program against poverty ever implemented in Brazil. It has directly and indirectly had several other positive effects on the social well-being of the Brazilian population (see Glewwe and Kassouf, 2012; Chioda et al., 2015, and others). With respect to the inclusion of this variable in the empirical model, two points deserve special mention: i) this is a comprehensive program, as most of the eligible families receive its cash transfer, so there is a strong correlation between this variable and poverty measures; ii) contrary to the common-sense view that the implementation of cash transfer programs guarantees a stock of votes that are insensitive to economic downturns and lenient with the phenomenon of corruption, there is empirical evidence showing that the programs implemented in Latin America do not have this adverse effect (Pavão, 2016). The PBF data are from the Ministry of Social Development and Hunger Alleviation (MDS).

The victory of the "yes" vote in the House of Representatives in favor of initiating an impeachment process against president Dilma Rousseff has led to an interruption, at least temporarily, in the PT government at the federal executive level and in the so-called "Lulism" (former president Lula's way of governing), which, represented the class that hoped for "a State that was strong enough to reduce inequality, but would not threaten the established order" (Singer, 2009, p.84). According to Singer, in the 2006 elections, the very low-income voters voted in mass for Lula's re-election. Assuming that this support remained for the election, re-election and sustenance of president Dilma Rousseff, since she replicated the policies that were focused on this lower income group, we controlled for i) per capita household income, ii) the percentage of people living in extreme poverty, and iii) income inequalities, as measured by the ratio of the per capita household income of the richest 10% and the poorest 40% in the distribution. We alternatively used the Theil and Gini indices for a sensitivity analysis. The data for these variables and for higher education were taken from the most recent Demographic Census, carried out by the Brazilian Institute of Geography and Statistics (IBGE) in 2010.

In short, we found statistically significant relationships between demonstration rate and the control variables that made up the estimated empirical models. Only the variable controlling for the income[7] and PBF program was not significant. However, we noticed that this conditional cash transfer program becomes statistically significant when the variable that controls for poverty is excluded from the specification. As we have already mentioned, these variables are correlated, but we chose to keep them together because they are both relevant controls and the value of the variance inflation factor is of no concern.

3. Concluding Remarks

We found a very high correlation between the numbers of demonstrators on the streets estimated by Military Police and by the organizers of the protests. We also found a moderate correlation between the percentage of votes in favor of president

[6]Information taken from the websites `http://g1.globo.com/politica/eleicoes/2014/coligacoes-partidarias/infografico/` e `http://www.eleicoes2012.info/`.

[7]The household income per capita is significant at 5% in the benchmark model.

Table 2: OLS estimates

Dependent variable: `demonstration rate from Military Police` (RD-MP)

Variable	I	II	III	IV
`dummy for political ally`	0.425**	0.417**	0.429**	0.420**
	(0.1833)	(0.1813)	(0.1815)	(0.1810)
`% votes in 2014`	−0.791***	−0.679***	−0.684***	−0.692***
	(0.2484)	(0.2483)	(0.2480)	(0.2476)
`household income per capita`	−1.796**	−1.181	−1.447	−1.348
	(0.8521)	(0.9458)	(1.0205)	(0.9455)
`% poverty`	−0.995**	−0.913*	−1.034**	−0.994**
	(0.4431)	(0.4667)	(0.5022)	(0.4619)
`conditional cash transfer`	−0.241	−0.295	−0.291	−0.289
	(0.2013)	(0.1999)	(0.1998)	(0.1996)
`higher education`	1.590***	1.636***	1.653***	1.594***
	(0.3747)	(0.3902)	(0.3870)	(0.3916)
`dummy for south`	0.800**	0.508	0.533	0.538
	(0.3303)	(0.3569)	(0.3593)	(0.3549)
`dummy for southeast`	−0.254	−0.406	−0.383	−0.386
	(0.3014)	(0.3199)	(0.3220)	(0.3152)
`dummy for midwest`	0.581*	0.0723	0.0982	0.0859
	(0.3221)	(0.3702)	(0.3725)	(0.3678)
`dummy for north`	0.426	0.0361	0.0653	0.0586
	(0.3233)	(0.3517)	(0.3514)	(0.3509)
`income inequality (ratio)`	1.290**	1.139*		
	(0.5742)	(0.6052)		
`urbanization rate`		−0.743	−0.856	−0.848
		(0.7269)	(0.7065)	(0.7033)
`demographic density`		−0.143**	−0.137**	−0.135**
		(0.06071)	(0.06028)	(0.06010)
`dummy for state's capital`		0.235	0.318	0.339
		(0.3103)	(0.3186)	(0.3190)
`income inequality (theil)`			1.635**	
			(0.8301)	
`income inequality (gini)`				3.488**
				(1.6319)
`Constant`	11.51**	12.34*	19.10**	19.48**
	(5.6577)	(6.3047)	(8.3709)	(8.1333)
Number of observations	278	278	278	278
Adj. R-squared	0.417	0.431	0.432	0.433
Variance inflation factor	6.83	6.76	7.34	6.64
Breusch-Pagan test (p-value)	0.25	0.63	0.54	0.55
Shapiro-Wilk test (p-value)	0.22	0.10	0.11	0.14

Notes: Stardard errors in parentheses.
***, ** e * denote significance at 1%, 5% and 10%, respectively.
All variables (excluding the dummy variables) are measured in logarithms.

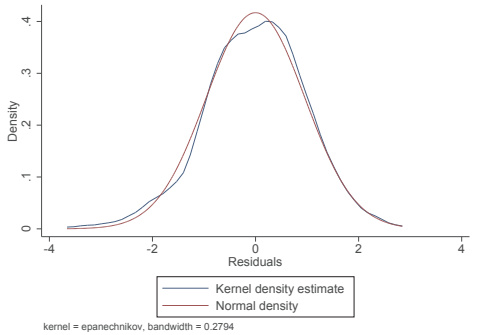

Figure 3: Estimate of the density function of the distribution of the benchmark model residuals

Rousseff's impeachment process and demonstration rate, regardless of the source used to construct this measure. We also found that, on average, the estimate given by the organizers was 62% greater than the official police estimate.

Our results confirm that there is a positive relationship between the higher education variable and the magnitude of street protests against Rousseff's administration and against corruption. We estimate a demonstration-education elasticity of 1.6. This evidence suggests that the elasticity of higher education with respect to the outrage seen in the demonstrations staged against the Dilma Rousseff's administration and against federal corruption is high and most likely rooted in the enthusiasm of June 2013, when a fairly uncommon profile for such events took the lead in these demonstrations.

Future efforts should focus on the economic, social, and historical relationships that led the population with a college degree to be more willing to take to the streets to protest against governors and corruption. We believe that we have taken the first step in this direction, but the data did not allow us to make progress toward identifying causal relationships. Our greatest limitation was the impossibility of controlling for the unobservable effects that are relevant for determining the scale of the demonstrations. To do this we would have to set up a panel of municipalities, which is impossible because there is no time variation in the regressors. It is also worth noting that, on the one hand, the fact that the majority of the municipalities in the sample are not contiguous does not allow us to control for a possible source of autocorrelation and/or spatial heterogeneity, but on the other hand it substantially reduces this type of problem.

Nevertheless, there are still some questions that could be addressed in future studies, such as controlling for the size of the population in neighboring municipalities assuming that residents in other municipalities would go and participate in demonstrations in large cities. Notwithstanding the above-mentioned weak points, we believe that the results shown in this paper are useful for discussions about the recent demonstrations that took place in Brazil against the Dilma Rousseff's administration and against corruption based on empirical evidence.

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